

UNITED STATES SIGNAL SERVICE

MONTHLY WEATHER REVIEW.

VOL. XVI.

WASHINGTON CITY, DECEMBER, 1888.

No. 12.

INTRODUCTION.

This REVIEW treats generally the meteorological conditions of the United States and Canada for December, 1888, and is based upon reports of regular and voluntary observers of both countries.

On chart i the paths of the centres of eight areas of low pressure are shown; the average number traced for December during the last fifteen years being 11.6.

The areas of high and low pressure are discussed under their respective headings. Descriptions of the storms that occurred over the north Atlantic Ocean are also given, and their approximate paths shown on chart i, on which also appear the limits of fog-belts west of the fortieth meridian. No ocean ice was reported during the month. Over the north Atlantic severe storms occurred off the coast of the United States from the 11th to 14th and 17th to 19th; over mid-ocean heavy gales were reported on the 4th, 9th, 18th, and 20th, while over the eastern part of the ocean the severest disturbances occurred on the 21st and 22d.

Chart ii exhibits the distribution of mean atmospheric pressure and mean temperature for the month. The mean temperature was above the normal over a greater part of the country, the greatest departures above the normal being noted in Montana and Dakota, where, at stations, they amounted to more than 15°. Over portions of the south Atlantic, middle, and eastern Gulf states the mean temperature was below the normal, the greatest deficiencies being shown over southern Florida, where they exceeded 4°. The means were also slightly below the normal within an area extending from southeast Arizona to north-central California. At a number of stations in the north-central and northwest districts the maximum temperatures were higher than for any preceding December during the periods of observation.

The distribution of rainfall for December, 1888, is shown on chart iii, and the normal precipitation for eighteen years is exhibited on chart iv.

The precipitation was in excess of the normal in California and the southern plateau region, within an area extending from central Texas northward to the lower Missouri valley, in portions of the upper lake region and the upper Mississippi valley, southern Florida, and from the northern part of the middle Atlantic states to the Canadian Maritime Provinces, except in a small area along the south New England coast. Elsewhere in the United States and Canada there was a deficiency in rainfall. Over a considerable portion of the country the departures from the normal December rainfall were marked. The current and normal precipitation at the various stations and in the several districts is treated in detail under the head-

ing of "Precipitation." In the table of excessive precipitation will be found a record of excessive monthly, daily, and hourly rainfalls for December; in a supplementary table excessive monthly, daily, and hourly rainfalls, not before available for publication, are given for each month for the periods of observation for all stations from which precipitation reports have been received. Following the table of supplementary excessive precipitation will be found a list of errors detected in the series of tables of excessive precipitation published in the REVIEW during 1888. The series of excessive precipitation tables published monthly during 1888, together with the supplementary table which appears in the current REVIEW, embraces all data of this class contained in reports received to date.

Chart v exhibits the depth of snow on the ground at the close of the month. It is proposed to publish similar charts in the REVIEW showing the depth of snow on the ground on the 15th and last day of each of the winter months. In the current month the depth of snow on the 15th was insufficient to admit of charting, and the small amount of snow which fell throughout the northern portion of the country constituted an unusual and noteworthy feature. This chart also shows the limits of freezing weather during December, 1888.

Commencing with July, 1888, the meteorological means for the regular stations of the Signal Service have been determined from observations taken twice daily at 8 a. m. and 8 p. m. (75th meridian time). These hours of observation have been permanently adopted to supersede the former system of tri-daily observations taken at eight-hour intervals.

In the preparation of this REVIEW the following data, received to January 20, 1889, have been used: the regular semi-daily weather-charts, containing data of simultaneous observations taken at 133 Signal Service stations and 22 Canadian stations, as telegraphed to this office; 175 monthly journals and 177 monthly means from the former and 22 monthly means from the latter; 420 monthly registers from voluntary observers; 95 monthly registers from United States Army post surgeons; marine records; international simultaneous observations; marine reports through the co-operation of the Hydrographic Office, United States Navy, and the "New York Herald Weather Service;" monthly weather reports from the local weather services of Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, and Texas, and the Central Pacific Railway Company; trustworthy newspaper extracts, and special reports.

ATMOSPHERIC PRESSURE (expressed in inches and hundredths).

The distribution of mean atmospheric pressure for December, 1888, as determined from observations taken daily at 8 a. m. and 8 p. m. (75th meridian time), is shown on chart ii by isobars. On July 1, 1888, the tri-daily observations of

the Signal Service were superseded by observations taken twice daily at the hours named. A protracted series of hourly observations has shown that the difference is almost inappreciable between the mean pressure obtained from two obser-